



MDCAT

FULL LENGTH PAPER-1

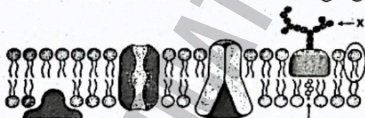
QUARTER SYLLABUS - 1

Total MCQs: 200

Max. Marks: 200

BIOLOGY

- Q.1** Most of the cellular machinery in humans is in the:
A) Nucleus C) Cytoplasm
B) Plasma membrane D) Mitochondria
- Q.2** Large globular proteins which project beyond the lipid layers on both sides helps to pass water soluble materials through the membrane are:
A) Peripheral proteins C) Integral proteins
B) Extrinsic proteins D) Oligosaccharides
- Q.3** Lipid molecules of plasma membrane are arranged:
A) Alternately C) In series
B) In parallel fashion D) In scattered form
- Q.4** Membrane proteins are held in the bilayer mainly by:
A) Hydrophobic attraction C) Covalent bonds
B) Hydrophilic attraction D) Ionic bonds
- Q.5** Structure of plasma membrane is shown in the following figure. Here 'X' indicates:



- A) Glycoprotein C) Peripheral protein
B) Cholesterol tail D) Cytoskeleton
- Q.6** Cell having secretory function have abundant:
A) Lysosomes C) Endoplasmic reticulum
B) Dictyosomes D) Osteosomes
- Q.7** Which of the following gives mechanical support to the cell?
A) Chloroplasts C) Mitochondria
B) Ribosomes D) Endoplasmic reticulum
- Q.8** The size of microtubule is:
A) 4.5nm C) 10nm
B) 20nm D) 25nm
- Q.9** Mitochondria is a semi-autonomous organelle because it contains:
A) Proteins C) DNA and RNA
B) RNA and ribosomes D) DNA, mRNA and ribosomes
- Q.10** If we separate the cell organelles of a living cell then which part should be alive?
A) Ribosome C) Cell wall
B) Chloroplast D) Endoplasmic reticulum
- Q.11** Ribosomes are classified according to their:
A) Sedimentation rate C) Size
B) Weight D) Volume
- Q.12** When a lysosome fuses with a phagosome, it results in the formation of:
A) Secondary lysosome C) Primary lysosome
B) Autophagic vacuole D) Residual body
- Q.13** The function of centrosome is:
A) To increase protein synthesis C) Inhibition of cell division
B) Initiates cell division D) Duplication of chromosome

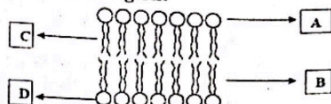


- Q.14 Which statement about prokaryotes is correct?**
A) They have membrane bound organelles
B) They possess a cell wall and a nucleus with a double membrane
C) They are all autotrophic
D) They reproduce asexually but genetic recombination does occur
- Q.15 A polysome is formed by:**
A) A cluster of ribosomal subunits
B) Many mRNAs being attached to a ribosome
C) A cluster of ribosomes
D) Many ribosomes attached to mRNA
- Q.16 Ribosomes in the chloroplasts of eukaryotic cells are:**
A) The same size and composition as in bacteria
B) Larger than in bacteria but of similar composition
C) Smaller than in bacteria and different in composition
D) The same size but completely different in composition from the ribosomes in bacteria
- Q.17 Which of the following is in direct contact with endoplasmic reticulum?**
A) Nucleoplasm
B) Nucleoli
C) Outer nuclear membrane
D) Inner nuclear membrane
- Q.18 Which pair of structures are usually found in both plant and animal cells?**
A) Cell membrane and nucleolus
B) Cell membrane and cell wall
C) Nucleolus and chloroplast
D) Nucleus and cell wall
- Q.19 Which of the following affects the association and dissociation of sub-units of ribosomes?**
A) Mg^{+2}
B) Ca^{+2}
C) Fe^{+2}
D) K^{+}
- Q.20 Cell secretions are the products formed on _____, processed in _____ and secreted through _____.**
A) SER, Golgi apparatus, vesicles
B) Golgi apparatus, lysosome, cell membrane
C) Ribosomes, Golgi apparatus, vesicles
D) RER, SER, lysosomes
- Q.21 It is true about arrangement of microtubules in a centriole:**
A) 9×0
B) 9×3
C) 9×3
D) 9×2
- Q.22 1,4 glycosidic linkage is found in all of the following except:**
A) Sucrose
B) Lactose
C) Maltose
D) Amylopectin
- Q.23 The reducing sugars are so called because they can _____ electron/s:**
A) Donate
B) Gain
C) Share
D) Excite
- Q.24 Which of the following is not true for monosaccharides?**
A) $(CH_2O)_n$
B) $n = 3 - 7$
C) Soluble
D) Hydrolysable
- Q.25 Number of amino acids in 5 turns of α -helix:**
A) 3.6
B) 6
C) 18
D) 36
- Q.26 When an assembly of more than one polypeptide occurs then it is known as _____ structure of protein.**
A) Secondary structure
B) Primary structure
C) Tertiary structure
D) Quaternary structure
- Q.27 Which one will be at tertiary structural level?**
A) Haemoglobin
B) Fibrin
C) Myoglobin
D) Keratin
- Q.28 All are related to lipids except:**
A) Compound of carbon, hydrogen and oxygen
B) Insoluble in water
C) Mostly associated with the fatty acids
D) Low energy compounds
- Q.29 Carboxylic group is found in:**
A) Fatty acids only
B) Amino acids only
C) Fatty acids and amino acids
D) Fatty acids, amino acids and nucleic acids



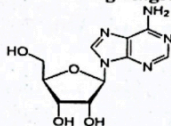
- Q.30** How many water molecules are consumed during the formation of one lecithin molecule?
A) 0
B) 2
C) 3
D) 4

- Q.31** Hydrophobic tail is present at which region:



- A) A and B
B) C and B
C) A and D
D) C Only

- Q.32** Which one is correct about the following diagram?



- A) It is a nucleotide
B) It contains pyrimidine nitrogen
C) It is used to form DNA
D) It is used to form RNA
- Q.33** Which statement correctly describes messenger RNA?
A) mRNA binds amino acids for incorporation into proteins
B) mRNA contains the five-carbon sugar deoxyribose
C) mRNA is a double stranded helix
D) mRNA recognizes the anti-codon of tRNA
- Q.34** When apoenzyme is separated from its metal component, its activity is:
A) Decreased
B) Lost
C) Increased
D) Remains unaffected
- Q.35** The rate of reaction depends directly on the amount of enzyme present at a specific time at:
A) Limited substrate concentration
B) Unlimited enzyme concentration
C) Unlimited substrate concentration
D) Limited enzyme concentration

- Q.36** It acts as a prosthetic group:
A) Heme group of cytochromes
B) NAD in mitochondria
C) HCl in stomach
D) Vitamin K for blood clotting

- Q.37** Which of the following may act as coenzyme?
A) Dipeptide
B) Disulphide
C) Dinucleotide
D) Disaccharide

- Q.38** Optimum pH value for the working of arginase is:
A) 5.50
B) 7.60
C) 9.00
D) 9.70

- Q.39** It is not true about coenzyme and activator:
A) Both are formed by vitamins
B) Both are non-protein parts
C) Both are detachable
D) Both are required in small amount

- Q.40** The activity of some enzymes is controlled by certain molecules binding to some specific area other than active site. This site is called as:

- A) Allosteric site
B) Binding site
C) Globular part
D) Catalytic site

- Q.41** Adenine of tRNA pairs with _____ of mRNA.

- A) Cytosine
B) Thymine
C) Uracil
D) Guanine

- Q.42** During synthesis of lagging strand, DNA polymerase jumps:

- A) Towards replication fork
B) Away from replication fork
C) Either towards or away from replication fork
D) Does not jump in anyway



Q.43 What is the correct sequence of enzymes related to DNA replication?

- A) Primase, helicase, ligase, DNA polymerase III
- B) Helicase, primase, DNA polymerase III, ligase
- C) Primase, helicase, DNA polymerase III, ligase
- D) DNA polymerase III, primase, ligase, helicase

Q.44 Which one is responsible for correct initiation of transcription?

- A) Transcription bubble
- B) Sigma factor
- C) Core enzyme
- D) RNA polymerase

Q.45 Which type of molecule is the end product of translation?

- A) An amino acid
- B) DNA
- C) mRNA
- D) Polypeptide

Q.46 A specific amino acid binds with tRNA at:

- A) Anticodon binding site
- B) Free 3' hydroxyl end
- C) Free 5' phosphate end
- D) Ribosome recognition site

Q.47 Translocation of ribosome on mRNA occurs due to:

- A) Polymerase
- B) Elongation factor
- C) Initiation factor
- D) Release factor

Q.48 Which process does not occur during the formation of mRNA?

- A) Condensation
- B) Replication
- C) Polymerization
- D) Transcription

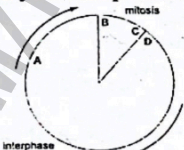
Q.49 Which is the site for translation in bacteria?

- A) Chloroplast
- B) Mitochondria
- C) Ribosome
- D) All A, B, C

Q.50 Which statement describes events during interphase of mitosis?

- A) Chromosomes start to coil, becoming shorter and fatter
- B) Chromosomes line up on the equator of spindle
- C) Chromosomes are pulled apart by spindle fibres
- D) Chromosomes are replicated ready for the next division

Q.51 The diagram shows the mitotic cell cycle. When radioactive nucleotides are supplied to dividing cells, at which point will they be incorporated into the chromosomes?



Q.52 Which one of the following stage precedes mitosis during cell cycle?

- A) G₁ phase
- B) G₂ phase
- C) S phase
- D) M phase

Q.53 Microtubules are involved in formation of:

- A) Asters
- B) Polar tubules
- C) Kinetochore fibers
- D) All A, B, C

Q.54 The kinetochore fibers contract while polar fibers elongate in pulling chromosomes apart during:

- A) Prophase
- B) Anaphase
- C) Metaphase
- D) Telophase

Q.55 In humans, the number of tetrads formed during mitosis is:

- A) 23
- B) 0
- C) 46
- D) 4

Q.56 Cytokinesis in animal cells starts at:

- A) Anaphase
- B) Late telophase
- C) Early telophase
- D) After end of telophase

Q.57 Reduction division occurs during the process of:

- A) Cleavage
- B) Fertilization
- C) Differentiation
- D) Spermatogenesis



- Q.58 Shortest phase of human cell cycle is:
 A) G₁-phase C) G₂-phase
 B) S-phase D) M-phase
- Q.59 Which of the following best describe the significance of mitosis?
 A) Genetic recombination C) Sexual reproduction
 B) Continuity of similar information D) Variations among offspring
- Q.60 In prophase I, crossing over takes place during:
 A) Leptotene C) Pachytene
 B) Zygotene D) Diplotene

CHEMISTRY

- Q.61 The average atomic mass of Cl is 35.5. It has two isotopes of masses 35 & 37. What is the percentage of heavier isotopes.
 A) 25% C) 75%
 B) 50% D) 100%
- Q.62 The E.F of an organic compound is C₃H₃O and molecular formula mass is 110 g/mol. Identify the compound
 A) C₆H₄O₄ C) C₄H₆O₄
 B) C₆H₆O₂ D) C₆H₆O₃
- Q.63 Which statement is incorrect regarding a chemical bond?
 A) Bond is formed by the overlapping of half-filled orbitals
 B) Bond is formed by the attractive forces of positive and negative ions
 C) Bond is formed by the overlapping of "s" orbital is strong
 D) Bond formed by the large sized atoms is strong
- Q.64 Percentage W/V of 2M solution of NaOH is
 A) 4% C) 12%
 B) 8% D) 2%
- Q.65 Half atmospheric pressure is
 A) 400 torr C) 50622 Pa
 B) 101.3 Pa D) 8.5 pounds
- Q.66 46 g of sodium metal have equal number of moles to
 A) 6.02×10^{23} atoms of K C) 44.8 dm³ of O₂
 B) 46 g of C₂H₅OH D) All of these
- Q.67 Total number of sigma bonding electrons in CO₂ are
 A) 2 N_A C) 6 N_A
 B) 4 N_A D) 8 N_A
- Q.68 Identify the pair which have same empirical formula
 A) Benzene and Ethylene C) Acetylene and Styrene
 B) Ethylene and Acetylene D) Formic acid and acetic acid
- Q.69 How many number of moles are present in 1Kg of caustic Soda
 A) 10 C) 20
 B) 15 D) 25
- Q.70 A solution contain 15g of urea in 250cm³. What is the molarity of this solution?
 A) 0.25M C) 0.75M
 B) 0.50M D) 1M
- Q.71 To find limiting reactant or theoretical yield which of the following law must be followed.
 A) Law of conservation of mass C) Law of definite proportion
 B) Avogadro's law D) Both A and C
- Q.72 The number of molecules in one mole of a substance is called Avogadro's number. The value of Avogadro's number is
 A) 1.661×10^{27} C) 1.661×10^{-24}
 B) $1/1.661 \times 10^{-24}$ D) 9.1095×10^{-31}
- Q.73 A reactant which control the amount of product is consumed earlier, it is called
 A) Limiting reactant C) Inert reactant
 B) Non-limiting reactant D) Reactive reactant



- Q.74 In Haber's process, the ratio of masses of reactants in chemical reaction is
 $N_2 + 3H_2 \rightarrow 2NH_3$
A) 1:3
B) 3:1
C) 4:6:1
D) 1:4:6
- Q.75 Which of the following standard is used to compare the atomic mass of Neon
A) Carbon-12
B) Carbon-13
C) Carbon-14
D) Hydrogen
- Q.76 A solution contain 90g water and 160 g CH_3OH , What is the mole percent of CH_3OH
A) 20%
B) 30%
C) 40%
D) 50%
- Q.77 What mass of Na_2CO_3 is required to prepare 0.5 molar solution
A) 53g
B) 5.3g
C) 0.53g
D) 106g
- Q.78 How many number of moles are present in 0.1kg of Ca.
A) 2.5mole
B) 10mole
C) 25mole
D) 0.25mole
- Q.79 44g CO_2 and 80g SO_3 at STP will occupy volume
A) $V_{CO_2} = V_{SO_3}$
B) $V_{CO_2} > V_{SO_3}$
C) $V_{CO_2} < V_{SO_3}$
D) Not predictable
- Q.80 The observed dipole of HX is 1.5D while its ionic dipole moment is 3.00D. The % ionic character of this compound is
A) 40%
B) 60%
C) 50%
D) 80%
- Q.81 If a gas is heated from $40^\circ C$ to $60^\circ C$, then change in temperature is $20^\circ C$. This change in temperature in Kelvin is
A) 293 K
B) 253 K
C) 273 K
D) 20 K
- Q.82 Current attempts have resulted in temperature as low as 10^{-5} K, which is _____ than absolute zero
A) Equal
B) Greater
C) Lesser
D) Not predictable
- Q.83 The root mean square velocity of gases has relation with temperature as
A) \sqrt{T}
B) T
C) $\frac{1}{T}$
D) $\sqrt{\frac{1}{T}}$
- Q.84 Which of the following gases show positive and negative deviation
A) H_e and H_2
B) N_2 and H_2
C) CO_2 and H_e
D) N_2 and CO_2
- Q.85 Which of the following equation is used for non-ideal gases
A) $PV = nRT$
B) $PV = \frac{1}{3} mNC^2$
C) $\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$
D) None of these
- Q.86 Which of the following show/exhibits H-Bonding
A) HF
B) HCl
C) HBr
D) HI
- Q.87 Correct boiling point trend of acetone, diethyl ether and water is
A) Water > Diethyl ether > Acetone
B) Water > Acetone > Diethyl ether
C) Acetone > Diethyl ether > Water
D) Acetone > Water > Diethyl ether
- Q.88 The amount of heat absorbed by one mole of solid at 1atm when it change into vapors is denoted by
A) ΔH_f
B) ΔH_v
C) ΔH_f
D) ΔH_{RX}



- Q.89** At 273K, ice occupies _____ more volume than water
A) 4 % C) 7%
B) 6 % D) 9%
- Q.90** The crystals of _____ are molecular solids
A) Sucrose C) Copper
B) Sodium chloride D) Diamond
- Q.91** The expression $PV = nRT$ represents the
A) Dalton's law C) General gas equation
B) Avogadro's law D) Van der Waal's equation
- Q.92** Total number of anions in one unit cell of sodium chloride are
A) 1 C) 4
B) 2 D) 8
- Q.93** Boiling point of glycerin at 1atm pressure is 563K. What will be the B.P at 50 Torr.
A) 290°C C) 210°C
B) 250°C D) 150°C
- Q.94** Type of bonding in sodium (Na) is
A) Metallic C) Ionic
B) Covalent D) Co-ordinate covalent
- Q.95** Vapour pressure of liquids is inversely proportional
A) Surface area C) Temperature
B) Intermolecular forces D) Both B and C
- Q.96** Boiling point of water will be minimum at
A) Karachi C) Sialkot
B) Lahore D) Skardu
- Q.97** Which organic compound has strongest London dispersion forces
A) n-Pentane C) neo-Pentane
B) iso-Pentane D) All have same.
- Q.98** Select the non-polar molecular solids from the given options
A) P_4 , S_8 , Dry ice C) I_2 , sucrose
B) Sugar, Dry ice D) Naphthalene, Glucose
- Q.99** What is the value of general gas constant R at 0°C and 1atm pressure
A) $0.0821 \text{ Cal}^{-1} \text{ mol}^{-1} \text{ K}^{-1}$ C) $0.0821 \text{ atm dm}^3 \text{ mol}^{-1} \text{ K}^{-1}$
B) $8.314 \text{ Jmol}^{-1} \text{ K}^{-1}$ D) $1.987 \text{ Cal mol}^{-1} \text{ K}^{-1}$
- Q.100** When helium gas loses two electrons, then it is actually like
A) α -particle C) γ -ray
B) β -particle D) X-ray
- Q.101** The number of electrons that are present in penultimate shell (second last shell) of O^{2-} is equal to number of electrons in
A) H^+ C) Na^+
B) He^+ D) H^+
- Q.102** Which of the following anion has same number of electrons as in argon
A) Ca^{+2} C) K^+
B) S^{2-} D) All are iso-electronic
- Q.103** In atomic particles which is correct statement
A) Charge of proton is equal to charge of Neutron
B) Mass of electron is equal to the mass of Neutron
C) Mass of proton is equal to mass of Neutron
D) Mass of proton is twice to mass of Neutron
- Q.104** How many neutrons are present in $^{69}_{31}\text{Ga}$
A) 31 C) 38
B) 69 D) 100
- Q.105** Which of the following pair is isobar
A) $^{12}_6\text{C}$, $^{14}_6\text{C}$ C) $^{15}_7\text{N}$, $^{16}_8\text{O}$
B) $^{14}_7\text{N}$, $^{14}_6\text{C}$ D) ^1_1H , ^4_2He



Q.106 With increase in value of principal quantum number "n", the shape of sigma orbitals remains same although their sizes

- A) Remain same
B) Increase
C) Decrease
D) Vary shell to shell

Q.107 The electronic configuration of Titanium may be denoted as

- A) $[\text{Ne}]4s^2, 3d^2$
B) $[\text{Ne}]4s^0, 3d^4$
C) $[\text{Ar}]4s^0, 3d^4$
D) $[\text{Ar}]4s^2, 3d^2$

Q.108 Which of the following is correct trend of energy of given orbitals. 4p, 3d, 5s, 4f

- A) $3d < 4p < 5s < 4f$
B) $3d < 4p < 4f < 5s$
C) $3d < 5s < 4p < 4f$
D) $3d < 4f < 4p < 5s$

Q.109 The lowest ionization energy is possessed by group _____ elements

- A) VII A
B) VIII A
C) II A
D) I A

Q.110 Total no. of s-orbitals electrons in _____ are equal to total s-orbital electrons in _____

- A) $_{19}\text{K}$
B) $_{21}\text{Sc}$
C) $_{26}\text{Fe}$
D) $_{23}\text{V}$

Q.111 Density of which gas is highest at room temperature

- A) Ne
B) NH_3
C) CH_4
D) H_2

Q.112 If the electronegativity difference b/w two atoms is zero then the bond is

- A) Polar covalent bond
B) Non-polar covalent bond
C) Ionic bond
D) Co-ordinate covalent bond

Q.113 Percentage covalent bond character in NH_4^+ is

- A) 25%
B) 75%
C) 50%
D) 80%

Q.114 Which option shows all the molecule with bond angle less than 109.5°

- A) BF_3 , H_2S , NH_3
B) NH_3 , H_2O , SO_3
C) H_2O , H_2S , NH_3
D) CO_2 , NF_3 , BF_3

Q.115 Which of the following molecule has highest dipole moment

- A) CO
B) CO_2
C) SO_2
D) H_2O

Q.116 In crystal lattice of ice, each O-atom of water molecule is attached to

- A) 1 H-atom
B) 2 H-atom
C) 3 H-atom
D) 4 H-atom

Q.117 Which type of forces are present in Kerosene oil.

- A) Dipole-dipole forces
B) H-Bonding
C) Debye forces
D) London dispersion forces

Q.118 According to VSEPR Theory, SnCl_2 belong to

- A) AB_2 system
B) AB_3 system
C) AB_4 system
D) AB_3E system

Q.119 Which of the following molecule has largest number of lone pairs.

- A) CO_2
B) BF_3
C) H_2O
D) N_2

Q.120 Boiling point of water is higher than petrol because IMF in water are

- A) Weaker than petrol
B) Stronger than petrol
C) Same as in petrol
D) Negligible

PHYSICS

Q.121 The SI unit is built up from _____ kinds of units

- A) 2
B) 3
C) 4
D) 5

Q.122 The uncertainty in potential is 3% and R is 2% what is uncertainty in power

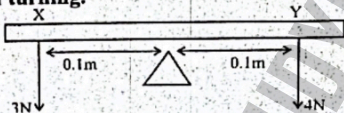
- A) 5%
B) 1%
C) 7%
D) 8%



- Q.123** A racing car accelerates with following average speeds 5ms^{-1} for 6 sec, 10ms^{-1} for 2 sec, 15ms^{-1} for 2 sec what is overall average speed of car
A) 5ms^{-1} C) 8ms^{-1}
B) 6ms^{-1} D) 7ms^{-1}
- Q.124** If first condition of equilibrium is satisfied body will be in _____ equilibrium
A) Rotational C) Complete
B) Translational D) Either A and B
- Q.125** Two bodies are projected with same velocity at 30° and 60° to horizontal the ratio of their height is
A) 1:1 C) 1:3
B) 3:1 D) 1:2
- Q.126** At the top of trajectory of projectile motion acceleration is
A) 0 C) Maximum
B) Minimum D) g
- Q.127** The law of conservation of linear momentum is consequence of Newton's
A) 1st law C) 3rd law
B) 2nd law D) Law of gravitation
- Q.128** Period of geostationary satellite is
A) 12 hrs C) 5 hrs
B) 24 hrs D) 8 hrs
- Q.129** Height of geostationary satellite is
A) 42300 km C) 400 km
B) 36000 km D) 500 km
- Q.130** If air resistance is ignored the horizontal motion of projectile is with
A) Constant acceleration C) Constant deceleration
B) Constant velocity D) Variable velocity
- Q.131** Horse power is a unit of
A) Energy C) Power
B) Intensity D) Efficiency
- Q.132** Which of the following is not the unit of energy?
A) Watt hour C) Joule
B) erg D) Kilowatt
- Q.133** To represent a physical quantity the least requirement is
A) Number C) Number, prefix, and unit
B) Number and unit D) Number, unit and direction
- Q.134** Which of given is not a physical quantity
A) Pressure C) Second
B) Speed D) Energy
- Q.135** Base units are those which
A) Cannot split further C) Use to define other units
B) Cannot define in term of other D) All are correct
- Q.136** 1 gram-cm^{-3} is equal to
A) 10^3 kg m^{-3} C) 10^{-3} kg m^{-3}
B) 1 kg m^{-3} D) 10^6 kg m^{-3}
- Q.137** Base unit of entropy
A) kg m s^{-2} C) $\text{kg m}^2\text{ s}^{-2}\text{ K}^{-1}$
B) $\text{kg m}^{-2}\text{ s}^2\text{ K}$ D) $\text{kg m}^2\text{ s}^{-2}\text{ K}^{-1}$
- Q.138** Match list - I with list - II
- | | |
|-----------------------|---------------------------------|
| <u>List - I</u> | <u>List - II</u> |
| (1) Joule | (a) henry x ampere/sec |
| (2) Watt | (b) coulomb x volt |
| (3) Volt | (c) meter x ohm |
| (4) resistivity | (d) (ampere) ² x ohm |
| A) 2-b, 3-d, 4-c, 1-a | C) 1-b, 2-d, 3-a, 4-c |
| B) 3-c, 2-a, 4-b, 1-d | D) 2-b, 3-c, 4-a, 1-d |



- Q.139 If percentage error in the measurement of length of a side of square is 1% and force is 3% then maximum error in pressure is
 A) 3% C) 4%
 B) 2% D) 5%
- Q.140 A student performs an experiment with simple pendulum and measures time for 10 vibrations. If he measures the time for 100 vibrations, the error in the measurement of time period will be reduced by a factor of
 A) 1000 C) 100
 B) 90 D) 10
- Q.141 The diagram shows a uniform beam pivoted at its center. Forces of 3N and 4N act in the directions shown what is the magnitude and position of the upward force which will prevent the beam from turning.



Force

Position

- A) 1 N
 B) 1 N
 C) 7 N
 D) 7 N

- X
 Y
 X
 Y

- Q.142 In a rocket of mass 1000 kg fuel is consumed at the rate of 40 Kg/s. The velocity of gasses ejected from the rocket is 5×10^4 m/s. The thrust on the rocket is:
 A) 2×10^3 N C) 2×10^6 N
 B) 5×10^4 N D) 2×10^9 N
- Q.143 A body is said to be in complete equilibrium if:
 A) $F = 0$ C) $\sum F = 0$ or $\sum \tau = 0$
 B) $\sum \tau = 0$ D) $\sum F = 0$ and $\sum \tau = 0$
- Q.144 The other name of torque is:
 A) Moments of inertia C) Moment of linear momentum
 B) Moment of force D) None of these
- Q.145 Anti-clockwise torque is taken as
 A) Positive C) Zero
 B) Negative D) None of these
- Q.146 The angular momentum of a body changes from 30 J-s to 50 J-s in 0.5 sec. The torque acting on it is
 A) 40 N-m C) 100 N-m
 B) 50 N-m D) 150 N-m
- Q.147 A stone is released from moving train the stone will follow
 A) Hyperbolic path C) Straight path
 B) Parabolic path D) Circular path
- Q.148 Angular acceleration is produced by
 A) Force C) Torque
 B) linear acceleration D) Angular momentum
- Q.149 The ballistic missiles are used for _____ range
 A) Long C) Medium
 B) Short D) May A or C
- Q.150 No body begin to move or comes to rest itself is statement of
 A) Newton C) Maxwell
 B) Abu Ali Sena D) Planck's
- Q.151 If a body of 1kg raised through 1m height work done will be
 A) 5J C) 1J
 B) 0.1J D) 10J
- Q.152 Power is dot product of
 A) Force and displacement C) Force and momentum
 B) Force and velocity D) Force and time



- Q.153 1MWh is equal to _____ joule.
A) 3.6×10^{10}
B) 3.6×10^9
C) 3.6×10^6
D) 3.6
- Q.154 Angle between linear and angular velocity is
A) 180°
B) 0°
C) 90°
D) 360°
- Q.155 A bucket filled with water is revolved in vertical circle of radius 4m. speed of bucket at highest point just to avoid fall of water is
A) 2 m s^{-1}
B) 4 m s^{-1}
C) 2.5 m s^{-1}
D) $2\pi \text{ m s}^{-1}$
- Q.156 The ratio of angular speeds of minute and hour hand of a watch is
A) 1:12
B) 12:1
C) 1:1
D) 1:24
- Q.157 The engine of an inter-city train travelling at 50 ms^{-1} delivers powers of 2 MW what is force exerted by engine
A) $4 \times 10^4 \text{ N}$
B) $1 \times 10^5 \text{ N}$
C) $4 \times 10^7 \text{ N}$
D) $1 \times 10^8 \text{ N}$
- Q.158 An object travels at constant speed around a circle of radius 1m in 1 sec, what is magnitudes of its acceleration
A) 0
B) 1 m s^{-2}
C) $2\pi \text{ ms}^{-1}$
D) $4\pi^2 \text{ ms}^{-2}$
- Q.159 One year is equal to
A) $3.35 \times 10^7 \text{ sec}$
B) $2.2 \times 10^7 \text{ sec}$
C) $3.2 \times 10^7 \text{ sec}$
D) $3.2 \times 10^6 \text{ sec}$
- Q.160 The SI unit of intensity of light is
A) Mole
B) Candela
C) kg
D) Ampere
- Q.161 Voltage V across the conductor is $V = 5.2 \pm 0.1$. The %age uncertainty in V is
A) 2%
B) 1%
C) 3%
D) 4%
- Q.162 The base unit of gravitational constant is
A) $\text{kg m}^2 \text{ s}^{-2}$
B) $\text{m}^{-1} \text{ s}^{-1}$
C) $\text{kg}^{-1} \text{ m}^3 \text{ s}^{-2}$
D) $\text{kg m}^{-1} \text{ s}^{-2}$
- Q.163 The least count of the metre rod is 0.1 cm. What is the permissible error in the length of the rod measured with it?
A) $\pm 0.2 \text{ cm}$
B) $\pm 0.1 \text{ cm}$
C) $\pm 0.05 \text{ cm}$
D) $\pm 0.01 \text{ cm}$
- Q.164 A door requires a minimum torque of 32.5 Nm in order to open it. What is the minimum distance of the handle from the hinge, if the door is to be pulled open with a force at the handle not greater than 50 N:
A) 0.33 m
B) 0.65 m
C) 0.71 m
D) 1.54 m
- Q.165 Moment due to a couple about a fixed point is equal to product of
A) Both forces and their perpendicular distance
B) One force and their perpendicular distance
C) Both forces and their average distance from pivoted point
D) None of these
- Q.166 If R is the max range of projectile then greatest height attained is
A) R
B) R/2
C) $\frac{R}{4}$
D) 2R
- Q.167 An aeroplane moving horizontally with 50 ms^{-1} drops a packet at 490 m height. Its time of flight is
A) 50 sec
B) 40 sec
C) 10 sec
D) 20 sec



Q.168 For long range and greater precision

- A) Powered
B) Remote control guided

- C) Powered and guided missile are used
D) Unpowered missile are used

Q.169 A 500 kg car takes a round turn of radius 50 m with a velocity of 36 km/hr. The centripetal force is

- A) 250 N
B) 750 N

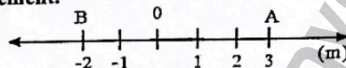
- C) 1000 N
D) 1200 N

Q.170 A ball of mass 0.25 kg attached to the end of a string of length 1.96 m is moving in a horizontal circle. The string will break if the tension is more than 25 N. What is the maximum speed with which the ball can be moved?

- A) 14 m/s
B) 3 m/s

- C) 3.92 m/s
D) 5 m/s

Q.171 As shown in the figure a particle moves from o to A, and then A to B. Find pathlength (distance) and displacement.



- A) 8m, -2m
B) 8m, -8m

- C) 2m, -2m
D) 2m, 2m

Q.172 The amount of work done by a labourer who carries "n" bricks, each of mass 'm', to the roof of a house whose height is "h"

- A) nmgh
B) Zero

- C) $\frac{mgh}{h}$
D) $\frac{ghn}{m}$

Q.173 Work done by gravity when P.E of body is increased is

- A) Positive
B) Negative

- C) Zero
D) Both positive and negative

Q.174 One second is equal to duration in which Cs-133 makes

- A) 1650763.73 vibration of Krypton clock
B) 652189.63 vibration of Krypton clock

- C) 1650765.73.73 vibration of Cesium clock
D) 9192631770 vibration of Cesium clock

Q.175 Range of projectile is same as that for θ and 2θ . The value of θ is:

- A) 15°
B) 45°

- C) 30°
D) 60°

Q.176 If linear momentum of body is increased by 1.5%, its kinetic energy increases by.....%

- A) 0%
B) 3%

- C) 10%
D) 5%

Q.177 A baseball is thrown vertically into the air. The acceleration of the ball at its highest point is:

- A) Zero
B) g, down

- C) g, up
D) 2g, down

Q.178 The S.I. unit of angular displacement is:

- A) Meter
B) Kilometer

- C) Radian
D) Centimeter

Q.179 The ratio of angular momentum to the time is equals to:

- A) Force
B) Torque

- C) Couple
D) None of these

Q.180 If a projectile is thrown with 19.6m/s velocity at 30° with x-axis, time taken to reach highest point?

- A) 1 sec
B) 2 sec

- C) 3 sec
D) 4 sec



ENGLISH

SPOT THE ERROR:

In the first type of sentences, some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected.

- Q.181** The one-fourth of mankind enclosed in one of the largest countries were brought out of the memory attic, with a loud bang.
A) B) C) D)
- Q.182** To be influencing those who are going to grow up and matter to the world was such fascinating to Katherine that she started loving Chips.
A) B) C) D)
- Q.183** The number of orders that are still to be executed are estimated at nearly a hundred.
A) B) C) D)
- Q.184** It was on this steep slope for my father once made me a little wooden plough.
A) B) C) D)
- Q.185** If Sarah knew that her colleagues were going to be so difficult, she would never have taken the job.
A) B) C) D)

CORRECTION:

In each of the following questions, four alternative sentences are given. Choose the CORRECT one and fill the Circle corresponding to that letter in the MCQ Response Form.

- Q.186**
A) Though the question of safety is settled, we can move on the other matters.
B) If the question of safety is settled, we can move on the other matters.
C) Therefore the question of safety is settled, we can move on the other matters.
D) Once the question of safety is settled, we can move on the other matters.
- Q.187**
A) The local council has decided not to allocate their funds for the project.
B) The local council have decided not to allocate their funds for the project.
C) The local council have decided not to allocate their funds for the project.
D) The local council has decided not to allocate their funds for the project.
- Q.188**
A) The lady and her dog which came yesterday have come again today.
B) The lady and her dog who came yesterday have come again today.
C) The lady and her dog that came yesterday have come again today.
D) The lady and her dog that which came yesterday have come again today.
- Q.189**
A) The vegetables that the old man grew in his secret garden was better flavor because of the sunshine in the clearing.
B) The vegetables that the old man grew in his secret garden were better flavor because the sunshine in the clearing.
C) The vegetables that the old man grew in his secret garden were better flavored because of the sunshine in the clearing.
D) The vegetables that the old man grew in his secret garden was better flavored because the sunshine in the clearing.
- Q.190**
A) Why don't you have a little holiday seeing you've finished your assignment?
B) Why don't you have a little holiday: seeing you've finished your assignment?
C) Why don't you have a little holiday; seeing you've finished your assignment?
D) Why don't you have a little holiday, seeing you've finished your assignment?



Sentence Completion:

Fill in the blanks with appropriate word.

- Q.191 From the moment I read that book I was _____ with the heroism and gallantry and poetry of Collins's life.
A) Enchanted C) Entangled
B) Cherished D) Cheated
- Q.192 For a split second, I thought about ignoring the call, but something _____ me to answer.
A) Dispelled C) Dissuaded
B) Compelled D) Dispersed
- Q.193 You will also have a constant reminder of your _____ actions through your own and your partner's permanent injuries.
A) Appalling C) Pushing
B) Thrilling D) Cushioning
- Q.194 Relevant staff then need to be _____ and the extent and quality of the team's skills base assessed.
A) Dejected C) Talked
B) Ignored D) Appraised
- Q.195 The artist varies his technique, sometimes painting lyrically, sometimes _____, with a near garish palette.
A) Smoothly C) Crudely
B) Causally D) Softly

Synonyms

Choose the word that is most nearly **SIMILAR** in meaning to the word in capital letters.

- Q.196 **APPARENTLY**
A) Frequently C) Prescriptively
B) Faithfully D) Ostensibly
- Q.197 **ALAS**
A) Inopportunately C) Alias
B) Favorably D) Alien
- Q.198 **DISGUISED**
A) Determined C) Shuddered
B) Shrouded D) Detrimental

Antonyms

Choose the word **OPPOSITE** in meaning to CAPITALIZED word given above.

- Q.199 **CURIOUS**
A) Officious C) Dispirited
B) Probing D) Offensive
- Q.200 **DISPENSING**
A) Begrudging C) Expanding
B) Providing D) Expensing

MCQ'S RESPONSE FORM

ID	A	B	C	D		A	B	C	D		A	B	C	D		A	B	C	D
1					56					112					168				
2					57					113					169				
3					58					114					170				
4					59					115					171				
5					60					116					172				
6					61					117					173				
7					62					118					174				
8					63					119					175				
9					64					120					176				
10					65					121					177				
11					66					122					178				
12					67					123					179				
13					68					124					180				
14					69					125					181				
15					70					126					182				
16					71					127					183				
17					72					128					184				
18					73					129					185				
19					74					130					186				
20					75					131					187				
21					76					132					188				
22					77					133					189				
23					78					134					190				
24					79					135					191				
25					80					136					192				
26					81					137					193				
27					82					138					194				
28					83					139					195				
29					84					140					196				
30					85					141					197				
31					86					142					198				
32					87					143					199				
33					88					144					200				
34					89					145					201				
35					90					146					202				
36					91					147					203				
37					92					148					204				
38					93					149					205				
39					94					150					206				
40					95					151					207				
41					96					152					208				
42					97					153					209				
43					98					154					210				
44					99					155					211				
45					100					156					212				
46					101					157					213				
47					102					158					214				
48					103					159					215				
49					104					160					216				
50					105					161					217				
51					106					162					218				
52					107					163					219				
53					108					164					220				
54					109					165									
55					110					166									
					111					167									

Roll No.									
0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9

NAME: _____

FATHER'S NAME: _____

ROLL NO. (IN WORDS): _____

CANDIDATE'S SIGNATURE: _____

DEPUTY SUPDT. SIGN: _____

INSTRUCTIONS

- USE BLUE BALL POINT PEN ONLY.
- PLEASE FILL IN THE ROLL NO. CORRECTLY.
- IT IS IMPORTANT THAT THE CIRCLE IS FILLED COMPLETELY AND CORRECTLY AS SHOWN IN THE EXAMPLE BELOW, OTHERWISE THE UNIVERSITY CAN NOT BE HELD RESPONSIBLE.

CORRECT EXAMPLE: ○ ● ○ ○ ✓

INCORRECT EXAMPLES: ○ ● ● ○ X
○ ○ ● ○ X
○ ○ ○ ● X
- DO NOT ERASE A RESPONSE ONCE THE CIRCLE HAS BEEN FILLED IN.
- INCOMPLETELY FILLED CIRCLES WILL NOT BE READ.
- MULTIPLE RESPONSE TO ONE QUESTION IS NOT ALLOWED.
- TEARING OFF THE RESPONSE FORM, FOLDING, STAPLING, CUTTING & PUTTING UNNECESSARY SIGNS AND IDENTIFICATION ON THE FORM WILL LEAD TO AUTOMATIC DISQUALIFICATION OF THE CANDIDATE.

THE UNIVERSITY SHALL NOT BE HELD RESPONSIBLE IF THE ABOVE INSTRUCTIONS ARE NOT FOLLOWED.